

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims

1. (Previously Presented) A nanotechnological structure for a scanning probe microscope, comprising a tip member, upstanding from a support member, and a nanowhisker comprising a heterojunction, wherein the nanowhisker is grown on and projecting from a free end of the tip member.
2. (Original) A structure according to claim 1, wherein the support member comprises a flexible member of predetermined dimensions and mechanical characteristics, the upstanding tip member being located at or adjacent a free end of the flexible member.
3. (Original) A structure according to claim 2, wherein the flexible member comprises an elongate beam.
4. (Original) A structure according to claim 1, wherein the nanowhisker comprises doped large band gap semiconductor material, to provide in use a narrow energy distribution of electrons flowing therethrough.
5. (Withdrawn) A structure according to claim 1, wherein the nanowhisker comprises a resonant tunnelling diode structure including a sequence of segments of semiconductor material of different band gaps.
6. (Withdrawn) A structure according to claim 1, wherein the nanowhisker comprises a light emitting diode structure including a sequence of segments of semiconductor material of different band gaps.
7. (Withdrawn) A structure according to claim 1, wherein a coaxial layer of material that is inert to biological material is provided along a length of the nanowhisker.
8. (Withdrawn) A structure according to claim 7, wherein the nanowhisker is formed of silicon, and the coaxial layer is silicon dioxide.

9. (Withdrawn) A structure according to claim 1, wherein the nanowhisker is formed of a magnetic material or semimagnetic material and capable of providing a stream of spin-polarised electrons.

10. (Withdrawn) A structure according to claim 9, wherein the nanowhisker comprises one of: MnInAs or MnGaAs or MnAs.

11. (Withdrawn) A structure according to claim 9, wherein the nanowhisker has only a single ferromagnetic domain.

12. (Withdrawn) A structure according to claim 2, wherein the flexible member is formed of a magnetic material.

13. (Previously Presented) A nanotechnological structure, comprising a flexible support member, the support member having an upstanding tip member formed at or adjacent a free end of the support member, and a nanowhisker containing a metal catalyst particle, wherein the nanowhisker is grown on a free end of the tip member.

14. (Original) A structure according to claim 13, wherein the flexible support member comprises an elongate beam.

15. (Original) A structure according to claim 13, wherein the nanowhisker comprises doped large band gap semiconductor material, to provide in use a narrow energy distribution of electrons flowing therethrough.

16. (Withdrawn) A structure according to claim 13, wherein the nanowhisker comprises a resonant tunnelling diode structure including a sequence of segments of semiconductor material of different band gaps.

17. (Withdrawn) A structure according to claim 13, wherein the nanowhisker comprises a light emitting diode structure including a sequence of segments of semiconductor material of different band gaps.

18. (Withdrawn) A structure according to claim 13, wherein a coaxial layer of material that is inert to biological material is provided along a length of the nanowhisker.

19. (Withdrawn) A structure according to claim 18, wherein the nanowhisker is formed of silicon, and the coaxial layer is silicon dioxide.

20. (Withdrawn) A structure according to claim 13, wherein the nanowhisker is formed of a magnetic material or semimagnetic material and capable of providing a stream of spin-polarised electrons.

21. (Withdrawn) A structure according to claim 20, wherein the nanowhisker comprises one of: MnAs or MnInAs or MnGaAs.

22. (Withdrawn) A structure according to claim 20, wherein the nanowhisker has only a single ferromagnetic domain.

23. (Withdrawn) A structure according to claim 13, wherein the support member is formed of a magnetic material.

24. (Withdrawn) A method of forming a nanotechnological structure for a scanning probe microscope, comprising:

providing a tip member;

providing at a free end of the tip member a mass of catalytic material; and

heating the mass and exposing the mass to gases of predetermined type under conditions such as to form, by a VLS process, a nanowhisker comprising a heterojunction, the nanowhisker upstanding from the tip member and projecting from a free end of the tip member.

25. (Withdrawn) A method according to claim 24, wherein the mass of catalytic material includes material provided on the tip member free end by an electrolytic process.

26. (Withdrawn) A method according to claim 24, wherein the mass of catalytic material includes material provided on the tip member free end by depositing an aerosol particle thereon.

27. (Withdrawn) A method according to claim 24, wherein the nanowhisker is formed of doped large band gap semiconductor material, to provide in use a narrow energy distribution of electrons flowing therethrough.

28. (Withdrawn) A method according to claim 24, wherein the nanowhisker is formed to include a resonant tunnelling diode structure having a sequence of segments of semiconductor material of different band gaps.

29. (Withdrawn) A method according to claim 24, wherein the nanowhisker is formed to include a light emitting diode structure having a sequence of segments of semiconductor material of different band gaps.

30. (Withdrawn) A method according to claim 24, wherein the nanowhisker is formed of a magnetic material or semimagnetic material and capable of providing a stream of spin-polarised electrons.

31. (Withdrawn) A method according to claim 30, wherein the nanowhisker comprises one of: MnAs, MnInAs or MnGaAs.

32. (Withdrawn) A method according to claim 30, wherein the nanowhisker has only a single ferromagnetic domain.

33. (Withdrawn) A method according to claim 24, wherein the tip member is mounted on a flexible support member of predetermined dimensions and wherein the flexible support member is formed of a magnetic material.

34. (Withdrawn) A method according to claim 24, wherein the catalytic material is of a same material as the nanowhisker.

35. (Withdrawn) A method according to claim 24, wherein the nanowhisker is formed of an oxidisable material, and the method further comprises exposing the nanowhisker to an oxidising environment so as to form a coaxial oxide layer along a length of the nanowhisker.

36. (Withdrawn) A method according to claim 24, further comprising:

terminating growth of the nanowhisker by changing at least one operating condition to provide at the end of the nanowhisker a segment of a different material from that of an adjacent portion of the nanowhisker; and

selectively etching the different material so as to remove the different material and the catalytic material from the nanowhisker.

37. (Withdrawn) A method of forming a nanotechnological structure, comprising:

providing an upstanding tip member at or near a free end of a flexible support member of predetermined dimensions and mechanical characteristics;

providing at a free end of the tip member a mass of catalytic material; and

heating the mass and exposing the mass to gases of predetermined type under conditions such as to form, by a VLS process, a nanowhisker containing a metal catalyst particle, the nanowhisker being grown on a free end of the tip member and upstanding from the tip member.

38. (Withdrawn) A method according to claim 37, wherein the support member comprises an elongate beam.

39. (Withdrawn) A method according to claim 38, wherein the mass of catalytic material includes material provided on the tip member free end by an electrolytic process or by deposition of an aerosol particle.

40. (Withdrawn) A method according to claim 37, wherein the nanowhisker is formed of doped large band gap semiconductor material, to provide in use a narrow energy distribution of electrons flowing therethrough.

41. (Withdrawn) A method according to claim 37, wherein the nanowhisker is formed to include a resonant tunnelling diode structure having a sequence of segments of semiconductor material of different band gaps.

42. (Withdrawn) A method according to claim 37, wherein the nanowhisker is formed to include a light emitting diode structure having a sequence of segments of semiconductor material of different band gaps.

43. (Withdrawn) A method according to claim 37, wherein the nanowhisker is formed of a magnetic material or semimagnetic material and capable of providing a stream of spin-polarised electrons.

44. (Withdrawn) A method according to claim 43, wherein the nanowhisker comprises one of: MnAs or MnInAs or MnGaAs.

45. (Withdrawn) A method according to claim 43, wherein the nanowhisker has only a single ferromagnetic domain.

46. (Withdrawn) A method according to claim 37, wherein the support member is formed of a magnetic material.

47. (Withdrawn) A method according to claim 37, wherein the catalytic material is of a same material as the nanowhisker.

48. (Withdrawn) A method according to claim 37, wherein the nanowhisker is formed of an oxidisable material, and the method further comprises exposing the nanowhisker to an oxidizing environment so as to form a coaxial oxide layer along a length of the nanowhisker.

49. (Withdrawn) A method according to claim 37, further comprising:
terminating growth of the nanowhisker by changing at least one operating condition to provide at an end of the nanowhisker a segment of a different material from that of an adjacent portion of the nanowhisker; and

selectively etching the different material so as to remove the different material and the catalytic material from the nanowhisker.

Claims 50-66 (Cancelled).

67. (Previously Presented) A structure according to claim 1, wherein the nanowhisker contains a metal catalyst particle.